

**Issue:**

- Traffic operations at Key Bridge and Whitehurst Freeway

**Preliminary Improvement(s):**

1. Geometric improvements to increase capacity.
2. Add "Downtown" and "Georgetown" signs on eastbound Canal Road, as well as "Whitehurst Freeway" and "Key Bridge" signs.
3. Add additional "No Right Turn on Red" sign for eastbound traffic at the Key Bridge.

**Evaluation:**

1. The "Georgetown Comprehensive Transportation Improvement Plan," prepared by Gorove/Slade Associates, Inc. and dated August 14, 2001 recommends widening eastbound Canal Road at the Whitehurst Freeway to provide an exclusive through lane, a shared through/right lane and an exclusive right lane. Additionally, it recommends carrying the second eastbound through lane past the Key Bridge and onto M Street. Appendix I shows a graphic displaying the proposed improvements at these intersections. The Consultant evaluated these improvements with the future year model and found them beneficial in reducing delays at these intersections. At this time, these improvements are only in the planning and proposal stages.
2. Existing signs are vague and confusing to out of town motorists. New signage should also reduce the number of vehicles caught in the wrong lane at the intersection of Canal Road and Whitehurst freeway, thereby improving operations on Canal Road.
3. The existing "No Right Turn on Red" sign is only visible from the left turning lane. Drivers in the right lane cannot see the sign. An additional sign should be installed on the signal pole in the southeast corner of the intersection.

**Recommendation:**

- Construct geometric changes and install new signs.

**W STREET****Issue:**

- Cut-through traffic

**Preliminary Improvement(s):**

1. Install all-way stop sign at 46<sup>th</sup> Street.

**Evaluation:**

1. This would further inconvenience drivers who use W Street as a cut-through route.

**Recommendation:**

- Change the operation of the intersection to all-way stop and install signs.

**OPTIMIZATION OF SIGNALIZED INTERSECTIONS**

All signalized intersections in the study were optimized based on the forecast one-year traffic volumes, which include background traffic growth, as well as all new development traffic. SYNCHRO Version 5 was used to automate the optimization. The Consultant

examined the signal timings and phasing that the computer program recommended and adjusted some of the timings based on established traffic engineering techniques.

Once the cycle lengths (generally 80 seconds during the AM peak and 120 seconds during the PM peak) were established by SYNCHRO, the intersection splits and offsets were optimized using SYNCHRO. SYNCHRO's optimization ensured that the splits at each intersection would provide the least amount of overall delay and greatest amount of capacity.

The following table shows the before and after cycle length, delay and level of service for each of the studied signalized intersections:

**Table 17:**  
***Comparison of One-year Optimized Network vs. Non-optimized Network***

Intersection	AM Non-optimized			AM optimized			PM Non-optimized			PM optimized		
	Cycle Length (s)	Delay (s)	LOS	Cycle Length (s)	Delay (s)	LOS	Cycle Length (s)	Delay (s)	LOS	Cycle Length (s)	Delay (s)	LOS
MacArthur Blvd and Loughboro Road	80	22.1	C	80	18.9	B	80	17.6	B	120	24.0	C
Loughboro Road and Dalecarlia Pkwy	n/a	52.1	F	n/a	52.0	F	n/a	17.3	C	n/a	13.7	B
Loughboro Road and Arizona Avenue	90	23.6	C	80	24.1	C	90	16.9	B	75	24.6	C
Loughboro Road and Foxhall Road	90	65.0	E	80	66.6	E	90	25.2	C	90	27.8	C
Canal Road and Chain Bridge	130	665.7	F	130	737.1	F	n/a	n/a	n/a	n/a	n/a	n/a
MacArthur Blvd and Macomb Street	n/a	44.6	E	n/a	44.7	E	n/a	12.6	B	n/a	19.6	C
Canal Road and Arizona Avenue	130	13.0	B	130	13.3	B	100	67.5	E	100	68.6	E
MacArthur Blvd and Arizona Avenue	80	49.6	D	80	52.2	D	80	44.3	D	80	53.0	D
Foxhall Road and Garfield Street	70	21.6	C	55	16.0	B	70	16.9	B	60	17.3	B
Canal Road and Reservoir Road	n/a	9.7	A	n/a	9.6	A	n/a	6.5	A	n/a	9.3	A
Foxhall Road and W Street	80	7.8	A	80	7.5	A	90	7.4	A	60	7.6	A
MacArthur Blvd and U Street	n/a	20.7	C	n/a	17.0	C	n/a	14.5	B	n/a	11.6	B
MacArthur Blvd and Reservoir Road (N)	80	67.5	E	40	60.9	E	80	4.2	A	60	6.8	A
MacArthur Blvd and Whitehaven Pkwy	n/a	10.9	B	n/a	13.7	B	n/a	13.1	B	n/a	13.5	B
MacArthur Blvd and Reservoir Road (S)	80	28.1	C	80	25.8	C	80	19.7	B	60	21.7	C
Foxhall Road and Whitehaven Pkwy	80	9.9	A	80	10.1	B	90	14.2	B	60	11.6	B
Foxhall Road and Reservoir Road	80	130.0	F	80	61.0	E	90	226.1	F	120	57.0	E
Foxhall Road/MacArthur Blvd/44th Street	80	41.9	D	80	43.1	D	90	22.5	C	120	4.9	A
Foxhall Road and Canal Road	80	57.0	E	80	61.3	E	90	86.1	F	120	46.7	D
Canal Road and Whitehurst Freeway	120	49.3	D	80	43.9	D	120	225.8	F	120	108.6	F
Canal Road and Key Bridge	80	76.7	E	80	39.7	D	90	22.2	C	120	29.3	C
<b>Overall</b>	<b>576.0</b>			<b>524.9</b>			<b>542.3</b>			<b>343.8</b>		

Note: n/a = not applicable. n/a in the "cycle length" column indicates an unsignalized intersection. n/a in the other columns indicates no stop-controlled or signalized movements during these time periods.

As Table 17 indicates, some of the intersections show an increase in delay and/or degradation of LOS. In order to create the best overall optimization of the network, cycle lengths and splits had to be adjusted for nearly every intersection. This primarily resulted

in increasing green times throughout the network. Increased green time allows for a greater traffic volume, which can increase delay when traffic is queued at an intersection. In other cases, making a greater effort to accommodate the major roadway at an intersection created additional delay on the minor street, sometimes increasing the overall delay.

However, the optimization results in a reduction of 9 and 37 percent in overall network delay during the AM and PM peak hours, respectively. The optimization generates reductions in delay for most of the intersections. It can be seen that some intersections experience a reduction in delay of over 50%, greatly improving their operation. In particular, the intersections of Foxhall Road with Whitehaven Parkway and W Street, which will experience the greatest amount of development traffic, are expected to operate at LOS B and LOS A, respectively. With these optimizations, the overall study area can be expected to see an improvement in its operational characteristics. Appendices J and K contain optimized AM and PM peak hour timing worksheets, respectively.